UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,920	04/22/2005	Rainer Richter	016906-0365	4566

22428 7590 02/27/2009

FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER
ALI, MOHAMMAD M

ART UNIT	PAPER NUMBER
3744	

MAIL DATE	DELIVERY MODE
02/27/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,920	RICHTER ET AL.	
	Examiner	Art Unit	
	MOHAMMAD M. ALI	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by G. E. Flurschutz hereinafter Flurschutz (U. S. Pat. No. 2,731,243.)

In regard to claims 1 and 2, Figs. 1, 2, 3 and 5 of Flurschutz discloses a heat exchanger, with a soldered/brazed/joined heat exchanger network consisting of flat tubes/channels (20/22) and of corrugated ribs/fins (17), a liquid and/or gaseous medium being capable of flow through the flat tubes and air being capable of flow around the corrugated ribs, (see Fig.2 for air passage), a corrugated rib (17) having in each case two rib surfaces (17, see Fig. 5) which are arranged essentially parallel to one another (see Fig. 5), and which are connected in each case by means of an arcuate piece (14, see Fig. 3 and 5) soldered/brazed/joined to a flat tube (20), characterized in that the arcuate piece (14) has a lower curvature in a middle portion than in a first outer portion and in a second outer portion, (see Figs 3 and 5), (as per claim 1); a heat exchanger in that the rib surfaces are equipped with gills (se the air passage 16 in Figs 3 and 5), (as per claim 2.)

In regard to claims 3-6, Figs. 8 of Flurschutz discloses a heat exchanger with the radius of curvature of the arcuate piece greater than the rib height, (as per claim 3), with the arcuate piece having in the first outer portion a radius of curvature which is lower than half a rib height of the corrugated rib (as per claim 4), the arcuate piece having in the second outer portion a radius of curvature which is greater than or equal to a radius of curvature in the first outer portion, (as per claim 5), the arcuate piece having in the second outer portion a radius of curvature which is lower than a rib height of the corrugated rib, (as per claim 6), (see col. 4, ln. 26-29).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz, as applied to claim 1 above, in view of Kuroyanagi et al., (U. S. Pat. No. 6,308,527 B1).

It is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that the corrugated rib has a rib division in the range of 1 to 3 mm.

However, Fig. 6B of Kuroyanagi et al. teaches the corrugated rib has a rib division (fp), in the range of 1 to 3 mm, (see col. 8., ln. 18.) Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the rib division of Kuroyanagi et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

6. Claims 9 , 11, 12-15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz, as applied to claim 1 above, in view of Shimoya et al. (U. S. Pat. No. 7,231,965 B2).

In regard to claim 9, it is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that the corrugated rib has a rib depth in, the range of 10 to 70 mm.

However, Fig. 16 of Shimoya et al. teaches the corrugated rib has a rib depth (B, and see col. 5, ln. 57-59) in the range of 10 to 70 mm. Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the rib depth of Shimoya et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

In regard to claim 11, it is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that corrugated rib has a rib height in a range of 3 to 15 mm.

However, Fig. 19 of Shimoya et al. teaches the corrugated rib has a rib height (C) in a range of 3 to 15 mm. (see col. 15, ln 65-67, and col. 16, ln. 1-3, and 21-32). Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Flurschutz with the rib height of Shimoya et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

Regarding claims 13-15, Shimoya et al disclose the rib depth of 10 to 70 mm which meets the limitations of claims 13-15 too.

Regarding claim 16, the heat exchanger of Flurschutz is capable of being used in motor vehicle as a refrigerant condenser.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz in view of Shimoya et al., and further in view of Hu et al., (U. S. Pat. No. 6,805,193 B2).

It is noted that Flurschutz does not specifically disclose the heat exchanger characterized in that the gills have a gill depth in a range of 0.5 to 1.5 mm and a gill angle in the range of 20 degree to 35 degree.

However, Fig. 7 of Shimoya et al. further discloses a gill depth (P) in a range of 0.5 to 1.5 mm, (see col.13, ln. 22-26); and Fig. 7 of Hu et al. discloses a gill angle in the range of 20 degree

to 35 degree (see col. 2, ln. 54-58). Hence, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the apparatus of Wölk with the gill depth of Shimoya et al. and the gill angle of Hu et al. resulting in a heat exchanger that would improve the heat transmission on the air side.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz, in view of Kuroyanagi et al., and further in view of Shimoya et al.

It is noted that Flurschuts does not specifically disclose the heat exchanger characterized in that the ratio of gill depth LP to rib division FP is in a range of 0.385 to 0.825. It is also noted that not all of the ranges of LP and FP of the invention fall into a ratio range of 0.385 to 0.825.

However, Fig. 6B of Kuroyanagi et al. teaches a rib division of 2.6 mm, and Fig. 7 of Shimoya et al. teaches a gill depth of 0.75 mm resulting in a gill depth to rib division ratio of 0.288. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller, 105 USPQ 233.*

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flurschutz in view of Kreutzer et al (US 5,361,829 A). Flurschutz discloses the invention substantially as claimed as stated above except soldering of rib. Kreutzer et al teach the use of soldering the rounded rib portion 4 with flat tubes 2 in a heat exchanger for the purpose of efficient heat transfer. See column 2, lines 40-41. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made

to modify the heat exchanger of Flurschutz in view of Kreutzer et al such that ribs could be soldered with the flat channels in order to exchange heat in efficient manner..

Response to Arguments

Applicant's arguments, see remarks, filed 10/09/08, with respect to the rejection(s) of claim(s) 1-11under 102 and 103 rejections have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of new prior art as explained above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD M. ALI whose telephone number is (571)272-4806. The examiner can normally be reached on maxiflex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4808. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad M Ali/
Primary Examiner, Art Unit 3744